

NSG-481

UNIVERSITY OF CALIFORNIA

(Los Angeles)

INSTITUTE OF GEOPHYSICS

Study of Tropical Cloud Structure and Patterning for  
Meteorological and Weather Satellite Data Interpretation

NSG 481-63

Final Report to N.A.S.A.

by

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## SUMMARY

The work under this grant has been successfully completed. It has resulted so far in one published paper and two unpublished reports to N. A. S. A. which will be published in due course.

The two related topics covered are the structure of individual tropical clouds and the study of cloud patterning a) jointly by satellite and aircraft observations and b) in relation to atmospheric flow patterns and their inherent disturbances and also perturbations by land masses.

The field phase of the work was carried out in the Caribbean area in the summer of 1963. Instrumented aircraft probed individual clouds and made reconnaissance missions over wide areas to relate cloud patterns to air flow. The analysis phase supported under the subject grant then continued until January 31, 1965. Numerical models of individual clouds were constructed and compared with the aircraft data, resulting in Reference 1, which we believe is a considerable contribution to cumulus dynamics and weather modification potentialities.

The second phase of the analysis involved study of the cloud patterns of the small flat island of Barbados, West Indies, and resulted in Reference 2. This work continues under other support and will be published in due course.

The third phase, of most interest to N. A. S. A. involves the satellite and aircraft study of a tropical disturbance and is presented in Reference 3. A paper on this material was presented by Dr. Joanne Malkus Simpson and Dr. Michael Garstang at the Fourth Technical Conference on Hurricanes and Tropical Meteorology in Miami, Florida, on November 24, 1965. It is now being prepared for publication.

REFERENCE

1. "Experimental Cumulus Dynamics" by Joanne (Malkus) Simpson, Robert H. Simpson, Donald A. Andrews and Max A. Eaton. Published in Reviews of Geophysics, V 3, pp. 387 - 431, August 1965. Two copies enclosed. More can be supplied if urgently needed.

2. "The Surface Temperature of a Tropical Island" by Margaret Chaffee. Reference No. 64 - 7 of The Woods Hole Oceanographic Institution. (Work supported by UCLA - NASA funds and directed by Dr. Joanne Malkus Simpson). February 1964. Twenty copies furnished NASA at time of distribution.

3. "A Study of a Non-Deepening Tropical Disturbance" by Joanne Malkus Simpson, Michael Garstang, Margaret Chaffee and Joseph Levine. August 1965 report issued by Florida State University ( Department of Meteorology). Dr. Joanne Malkus Simpson's and Miss Chaffee's contribution provided by U.C.L.A. - NASA. Two copies furnished herewith. More can be provided if urgently needed.